

The foregoing is intended merely as a preliminary communication, since, as already mentioned, I purpose to treat the development of *Dreissena* more fully later on. In conclusion I would just remark that Prof. Blochmann writes to me from Rostock that he has found the larvæ of *Dreissena* in the Warnow. Finally, I cannot refrain from expressing in this place also my most sincere thanks to privy-councillor Schulze for the great kindness with which he placed the resources of the Institute at my disposal for the collection of material, which was repeatedly necessary, and afforded me the opportunity of making abundant use of the reservoir in the garden of the Institute, whereby my task was materially facilitated.

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XXVIII.—*Remarks on Australian Slugs.* By C. HEDLEY, F.L.S., Assistant in Zoology to the Australian Museum.

IN a recent number (Feb. 1891) of this Magazine exception was taken by my friend Mr. Pilsbry to the treatment of some American slugs by Mr. Cockerell. I also wish, as "one who has studied the species in their native forests," to add my remonstrance against the manner in which the same author has dealt with the Australian representatives in his essay "On the Geographical Distribution of Slugs" (P. Z. S. 1891, pp. 214-226). I hope that I am not overstepping the bounds of courteous criticism by characterizing this article as somewhat superficial though pretentious, and by adding that the conchological fraternity would have been more grateful to this author had he contributed to the treasury of science more "facts and figures" and fewer MSS. names and imperfect generic diagnoses.

The description\* of *Limax megalodontes*, Quoy and Gaimard, though considered by Mr. Cockerell not to be very clear, is amply sufficient to debar the entrance of that species into the genus *Aneitea*. The jaw is minutely described and is certainly that of a *Limax*, while the statements that "le manteau assez étendu est ovale [that of *Aneitea* is always triangular] et susceptible sans doute de recouvrir la tête. . . . La couleur de cet individu est d'un blanc jaunâtre parsemé de taches noir. . . . Sa longueur est d'un pouce huit lignes," convince me the French writers had before them the introduced species *L. flavus*, Linn., still common in the same locality.

\* Voyage of the 'Uranie,' Zoology, p. 426.

The conclusion has forced itself upon me that all the species of *Limax* described as native to Australasia may be referred to either *L. maximus*, *flavus*, *gagates*, *agrestis*, or *levis*, all introduced from Europe. Mr. Cockerell prefaces his remarks by assuring his readers that the powers of migration of a slug are extremely limited. Be that as it may, in their race to the antipodes they have far outstripped their shell-bearing relatives. Tasmanian specimens of *L. maximus* were observed to be infested with an acarus, which, unfortunately, I failed to preserve. Should it prove to be identical with the parasitic attendant of the European mollusk, this fact would argue that the animals migrated not in the egg but in the adult stage.

After examining several hundreds of the handsome diamond-slug, *Aneitea Graeffei*, Humbert, from various localities ranging along fourteen degrees of latitude, I reiterate the opinion formerly expressed (Proc. Roy. Soc. Queensland, vol. v. pt. v. pp. 162-173) that only one species of this genus is yet known to inhabit Australia, and that, with all deference to Mr. Cockerell's decision, *A. Kreffti* and *Schutei* are mere synonyms. The colour, size, and shape, as well as all details of the external anatomy, are so obscured in spirit-specimens of slugs that specific characters should be described from such with extreme caution. As instancing the difference between living and preserved specimens I would invite comparison between two figures of *A. Graeffei*, (a) 'Mémoires de la Société de Physique et d'Histoire Naturelle de Genève,' vol. xvii. pt. 1, pl. xi. fig. 2, from an alcoholic specimen, and (b) 'Proceedings of the Royal Society of Queensland,' vol. v. pt. 5, pl. vii. fig. 1 (published with vol. vi. pt. 1), from life; as well as between those of *Cystopelta Petterdi*, Tate, (a) 'Proceedings of the Linnean Society of New South Wales,' (2) vol. v. pt. 1, pl. i. fig. 1, from an alcoholic specimen, and (b) *op. cit.* vol. vi. pt. 1, pl. iii. fig. 4, from life.

When Mr. Cockerell writes of *A. Macdonaldi*, Gray, "New Caledonia, and reputed also to occur in the New Hebrides," he has evidently transposed the localities, as a glance at Dr. Macdonald's original description in an early number of this periodical will show. Indeed, it is from the island of Aneiteum, in the New Hebrides, that the genus derives its name. It was also collected in that island by the well-known traveller and zoologist Mr. John Brazier, and is unknown in New Caledonia.

To Australia Mr. Cockerell assigns eighteen species of *Helicarion*. I can only say that Australian naturalists are unacquainted with eighteen, or even with eight, indigenous

species of this genus; to have reached this total our author must have impressed every available synonym and enlisted an odd genus or so as well.

“Such species as *H. Cumingi*, Beck, . . . might be separated from *Helicarion* by their shells alone, at least subgenerically.” In this conclusion he is perfectly correct, but was anticipated some twenty years since by Prof. Semper, who demonstrated anatomically (Reis. im Phil. vol. iii. pt. 1, p. 56) the position of this mollusk in the genus *Xesta*. *H. Hilli*, Cox, should be classified as a *Nanina* (see ‘Records of the Australian Museum,’ vol. i. p. 136). The fact that Garrett (P. Z. S. 1887, p. 315) throws grave doubts on the Fijian habitat of *Parmella* is disregarded by Mr. Cockerell, who copies the probably fictitious locality from his predecessors. A notice by myself on the genus (‘Records of the Australian Museum,’ vol. i. pp. 78-80, pl. xi.) appears to have shared the fate of much other molluscan literature, and to have escaped the observation of this author, who should have referred this genus to the *Helicarioninae*.

In reference to *Cystopelta* Mr. Cockerell seems to have read my article, which he quotes so approvingly, without having quite understood it. I beg to repeat emphatically that this genus has *not* the teeth of *Testacella*, neither has it the jaw of *Arion*. “Of this,” to quote our merry friend, “there is no possible doubt, no probable possible shadow of doubt, no possible doubt whatever.” Also that *Cystopelta* has not the slightest resemblance or affinity to either the *Testacellidae* or the *Selenitidae*. Further, that *Cystopelta* is a much modified and aberrant member of the *Helicarioninae*. I believe that any modern malacological student who attentively examines the drawings and descriptions appearing in the Proc. Linn. Soc. N. S. W. (2) vol. v. pp. 44-46, pl. i., and vol. vi. pp. 24, 25, pl. iii. fig. 4, will agree with me.

The classification of our land Mollusca sadly needs revision; but a ramble through the British Museum and a study of text-books are not a sufficient qualification for the task, and it is to be hoped that before Mr. Cockerell again addresses himself to it that he will serve a considerable apprenticeship to biological science with the microscope, dissecting-needle, and sketch-book.

Linnean Hall,  
Sydney, N. S. W.,  
December 12, 1891.